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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No. P04362

First Inventor or Application Identifier Willig

Title Porab e Internet Browser Device with Cordless Phone Module and Method of Operation

Express Mail Label No. EJ033100602US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. * Fee Transmittal Form (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)
2. Specification [Total Pages 31]
 - Descriptive title of the Invention
 - Cross References to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to Microfiche Appendix
 - Background of the Invention
 - Brief Summary of the Invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
3. Drawing(s) (35 U.S.C. 113) [Total Sheets 4]
4. Oath or Declaration [Total Pages 3]
 - a. Newly executed (original or copy)
 - b. Copy from a prior application (37 C.F.R. § 1.63(d))
(for continuation/divisional with Box 16 completed)
 - i. DELETION OF INVENTOR(S)
Signed statement attached deleting
inventor(s) named in the prior application,
see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

* NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:

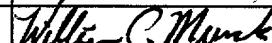
Continuation Divisional Continuation-in-part (CIP) of prior application No: _____

Prior application information: Examiner _____ Group / Art Unit: _____

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

<input type="checkbox"/> Customer Number or Bar Code Label	(Insert Customer No. or Attach bar code label here)			<input checked="" type="checkbox"/> Correspondence address below
Name	John L. Maxin National Semiconductor			
Address	801 East Campbell Road, Suite 525			
City	Richardson	State	TX	Zip Code
Country	USA	Telephone	972-680-4523	Fax

Name (Print/Type)	William A. Munck, Esq.	Registration No. (Attorney/Agent)	39,308
Signature			Date

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FEE TRANSMITTAL

for FY 2000

Patent fees are subject to annual revision.

Small Entity payments must be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12.

TOTAL AMOUNT OF PAYMENT (\$ 708)

Complete if Known

Application Number	
Filing Date	
First Named Inventor	Willig
Examiner Name	Not Assigned
Group / Art Unit	
Attorney Docket No.	P04362

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METHOD OF PAYMENT (check one)		FEE CALCULATION (continued)																																																																																																																																			
1. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any over payments to: Deposit Account Number 140448 Deposit Account Name National Semiconductor Corporation <input checked="" type="checkbox"/> Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17		3. ADDITIONAL FEES <table border="1"> <thead> <tr> <th>Large Entity Fee Code (\$)</th> <th>Small Entity Fee Code (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr><td>105</td><td>130</td><td>205 65 Surcharge - late filing fee or oath</td><td></td></tr> <tr><td>127</td><td>50</td><td>227 25 Surcharge - late provisional filing fee or cover sheet</td><td></td></tr> <tr><td>139</td><td>130</td><td>139 130 Non-English specification</td><td></td></tr> <tr><td>147</td><td>2,520</td><td>147 2,520 For filing a request for reexamination</td><td></td></tr> <tr><td>112</td><td>920*</td><td>112 920* Requesting publication of SIR prior to Examiner action</td><td></td></tr> <tr><td>113</td><td>1,840*</td><td>113 1,840* Requesting publication of SIR after Examiner action</td><td></td></tr> <tr><td>115</td><td>110</td><td>215 55 Extension for reply within first month</td><td></td></tr> <tr><td>116</td><td>380</td><td>216 190 Extension for reply within second month</td><td></td></tr> <tr><td>117</td><td>870</td><td>217 435 Extension for reply within third month</td><td></td></tr> <tr><td>118</td><td>1,360</td><td>218 680 Extension for reply within fourth month</td><td></td></tr> <tr><td>128</td><td>1,850</td><td>228 925 Extension for reply within fifth month</td><td></td></tr> <tr><td>119</td><td>300</td><td>219 150 Notice of Appeal</td><td></td></tr> <tr><td>120</td><td>300</td><td>220 150 Filing a brief in support of an appeal</td><td></td></tr> <tr><td>121</td><td>260</td><td>221 130 Request for oral hearing</td><td></td></tr> <tr><td>138</td><td>1,510</td><td>138 1,510 Petition to institute a public use proceeding</td><td></td></tr> <tr><td>140</td><td>110</td><td>240 55 Petition to revive - unavoidable</td><td></td></tr> <tr><td>141</td><td>1,210</td><td>241 605 Petition to revive - unintentional</td><td></td></tr> <tr><td>142</td><td>1,210</td><td>242 605 Utility issue fee (or reissue)</td><td></td></tr> <tr><td>143</td><td>430</td><td>243 215 Design issue fee</td><td></td></tr> <tr><td>144</td><td>580</td><td>244 290 Plant issue fee</td><td></td></tr> <tr><td>122</td><td>130</td><td>122 130 Petitions to the Commissioner</td><td></td></tr> <tr><td>123</td><td>50</td><td>123 50 Petitions related to provisional applications</td><td></td></tr> <tr><td>126</td><td>240</td><td>126 240 Submission of Information Disclosure Stmt</td><td></td></tr> <tr><td>581</td><td>40</td><td>581 40 Recording each patent assignment per property (times number of properties)</td><td></td></tr> <tr><td>146</td><td>690</td><td>246 345 Filing a submission after final rejection (37 CFR 1.129(a))</td><td></td></tr> <tr><td>149</td><td>690</td><td>249 345 For each additional invention to be examined (37 CFR 1.129(b))</td><td></td></tr> <tr><td colspan="4">Other fee (specify) _____</td></tr> <tr><td colspan="4">Other fee (specify) _____</td></tr> <tr> <td colspan="2">SUBTOTAL (1) (\$ 690)</td> <td colspan="4">SUBTOTAL (3) (\$)</td> </tr> <tr> <td colspan="4">* Reduced by Basic Filing Fee Paid</td> <td colspan="2"></td> </tr> </tbody> </table>				Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid	105	130	205 65 Surcharge - late filing fee or oath		127	50	227 25 Surcharge - late provisional filing fee or cover sheet		139	130	139 130 Non-English specification		147	2,520	147 2,520 For filing a request for reexamination		112	920*	112 920* Requesting publication of SIR prior to Examiner action		113	1,840*	113 1,840* Requesting publication of SIR after Examiner action		115	110	215 55 Extension for reply within first month		116	380	216 190 Extension for reply within second month		117	870	217 435 Extension for reply within third month		118	1,360	218 680 Extension for reply within fourth month		128	1,850	228 925 Extension for reply within fifth month		119	300	219 150 Notice of Appeal		120	300	220 150 Filing a brief in support of an appeal		121	260	221 130 Request for oral hearing		138	1,510	138 1,510 Petition to institute a public use proceeding		140	110	240 55 Petition to revive - unavoidable		141	1,210	241 605 Petition to revive - unintentional		142	1,210	242 605 Utility issue fee (or reissue)		143	430	243 215 Design issue fee		144	580	244 290 Plant issue fee		122	130	122 130 Petitions to the Commissioner		123	50	123 50 Petitions related to provisional applications		126	240	126 240 Submission of Information Disclosure Stmt		581	40	581 40 Recording each patent assignment per property (times number of properties)		146	690	246 345 Filing a submission after final rejection (37 CFR 1.129(a))		149	690	249 345 For each additional invention to be examined (37 CFR 1.129(b))		Other fee (specify) _____				Other fee (specify) _____				SUBTOTAL (1) (\$ 690)		SUBTOTAL (3) (\$)				* Reduced by Basic Filing Fee Paid					
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**or number previously paid, if greater; For Reissues, see below

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
103	18	203 9 Claims in excess of 20
102	78	202 39 Independent claims in excess of 3
104	260	204 130 Multiple dependent claim, if not paid
109	78	209 39 ** Reissue independent claims over original patent
110	18	210 9 ** Reissue claims in excess of 20 and over original patent
SUBTOTAL (2) (\$)		18

SUBMITTED BY

Typed or Printed Name	William A. Munck, Esq.	Complete (if applicable)
Signature	<i>William A. Munck</i>	Reg. Number 39,308
	Date <i>Sept 26, 2000</i>	Deposit Account User ID 140448

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Laura Zavala
Typed or printed name of person mailing

Laura Zavala
Signature of person mailing

Attachments:

1. Return acknowledgement postcard
2. Utility patent transmittal
3. Fee transmittal
4. 31 pages of the specification - Docket No: P04362
5. 4 sheets of drawings
6. Declaration of 1 inventor(s) Unsigned
7. Recordation form and Assignment(s) from 1 inventor(s) (optional)

PORTABLE INTERNET BROWSER DEVICE WITH CORDLESS
PHONE MODULE AND METHOD OF OPERATION

Inventor(s) :

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4224 Edith Drive
Fort Collins
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Colorado 80526
United States Citizen

Assignee:

National Semiconductor Corporation
2900 Semiconductor Drive
Santa Clara, California 58090

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<u>Laura Zavala</u> Signature of Person Mailing	<u>9-26-00</u> Date	

William A. Munck
John T. Mockler
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750 North Saint Paul Street
Suite 2000
Dallas, Texas 75201-3286
(214) 922-9221

**PORABLE INTERNET BROWSER DEVICE WITH CORDLESS
PHONE MODULE AND METHOD OF OPERATION**

TECHNICAL FIELD OF THE INVENTION

The present invention is generally directed to handheld computers and similar personal digital assistant (PDA) devices and, more specifically, to a portable Internet browser device that incorporates a cordless phone module.

BACKGROUND OF THE INVENTION

The personal computer (PC) has become ubiquitous in society. Personal computers are used in the home and in the office for a variety of purposes, one of the most important of which is accessing the Internet. A personal computer may be used to browse web sites and to send and to receive e-mail. The average price of a personal computer has fallen to the point where it is affordable to most of the population, which further increases the importance of Internet applications.

Despite the popularity of the personal computer, it is expected that future Internet development will focus on non-PC devices that are capable of accessing the Internet. These "web-

enabled" devices include many conventional appliances (e.g., stereos, refrigerators, and the like) that may access the Internet for any number of purposes, such as notifying the manufacturer of a malfunction, downloading a software upgrade from the 5 manufacturer, transmitting owner warranty information to the manufacturer, and the like. Internet telephones may eventually replace conventional telephones as "voice-over-IP" technology becomes more fully developed.

DOCKET NO. P04362

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telephone network or to a proprietary local area network (LAN). A wireless PAD allows the user to move around the home or office while browsing the Internet. The base station may be incorporated in a cradle that normally holds and recharges the PAD when it is 5 not in use. An example of a web-enabled personal access device (PAD) is the Geode™ WebPAD™ system from National Semiconductor Corporation.

While the different types of web-enabled devices are intended to offer cheaper, more user-friendly access to the Internet than a conventional personal computer, many cost savings are not realized because of the redundancy in hardware or software functions of these web-enabled devices. For example, a PAD such as the Geode™ WebPAD™ system and a Palm VII organizer both contain an LCD screen and a wireless transceiver. Additionally, much of the software in these devices also is redundant. Moreover, PADs and electronic organizers do not provide the functionality of a telephone, so that a consumer must still own a separate Internet telephone in order to use the Internet for phone service. This further adds to the consumer's equipment costs.

20 There is therefore a need in the art for improved web-enabled devices that allow a user to access the Internet for a wide variety of applications. In particular, there is a need for a web-enabled

personal access device (PAD) that is capable of browsing Internet web sites and capable of operating as an Internet telephone.

SUMMARY OF THE INVENTION

To address the above-discussed deficiencies of the prior art, it is a primary object of the present invention to provide a personal access device (PAD) capable of browsing web sites on an Internet protocol (IP) network and also capable of operating as a cordless phone that provides a conventional phone connection and a voice-over-IP phone connection. According to an advantageous embodiment of the present invention, the personal access device comprises: 1) a radio frequency (RF) transceiver capable of wirelessly communicating with a base station coupled to the IP network, wherein the RF transceiver transmits IP data packets to the base station and receives IP data packets from the base station; and 2) a PAD controller capable of executing an Internet browser application and displaying web pages associated with the web sites on a display screen of the personal access device, wherein the PAD controller is further capable of transmitting voice data to, and receiving voice data from, the base station via the RF transceiver.

According to one embodiment of the present invention, the PAD controller transmits the voice data to, and receives the voice data from, the base station in Internet protocol (IP) data packets.

According to another embodiment of the present invention, the PAD controller and the base station establish a low latency connection for transmitting and receiving the IP data packets containing the voice data.

5 According to still another embodiment of the present invention, the PAD controller executes a voice-over-IP application capable of transmitting and receiving the IP data packets.

In one embodiment of the present invention, the personal access device further comprises a microphone for detecting the voice of a user and a speaker for transmitting an incoming voice signal to the user.

10 In another embodiment of the present invention, the personal access device comprises a display screen module capable of housing the display screen and a user control module removably attached to the display screen module, wherein the RF transceiver and the PAD controller are disposed in the user control module.

15 In still another embodiment of the present invention, the microphone and the speaker are disposed in the user control module.

20 In yet another embodiment of the present invention, the PAD controller is capable of determining when the user control module and the display screen module are separated.

In a further embodiment of the present invention, the PAD

controller, in response to a determination that the user control module and the display screen module are separated, establishes a low latency connection to the base station for transmitting and receiving the voice data.

5 The foregoing has outlined rather broadly the features and technical advantages of the present invention so that those skilled in the art may better understand the detailed description of the invention that follows. Additional features and advantages of the invention will be described hereinafter that form the subject of the claims of the invention. Those skilled in the art should appreciate that they may readily use the conception and the specific embodiment disclosed as a basis for modifying or designing other structures for carrying out the same purposes of the present invention. Those skilled in the art should also realize that such equivalent constructions do not depart from the spirit and scope of the invention in its broadest form.

10 Before undertaking the DETAILED DESCRIPTION OF THE INVENTION below, it may be advantageous to set forth definitions of certain words and phrases used throughout this patent document: the terms
15 "include" and "comprise," as well as derivatives thereof, mean inclusion without limitation; the term "or," is inclusive, meaning and/or; the phrases "associated with" and "associated therewith,"

as well as derivatives thereof, may mean to include, be included within, interconnect with, contain, be contained within, connect to or with, couple to or with, be communicable with, cooperate with, interleave, juxtapose, be proximate to, be bound to or with, have, 5 have a property of, or the like; and the term "controller" means any device, system or part thereof that controls at least one operation, such a device may be implemented in hardware, firmware or software, or some combination of at least two of the same. It should be noted that the functionality associated with any particular controller may be centralized or distributed, whether locally or remotely. Definitions for certain words and phrases are provided throughout this patent document, those of ordinary skill in the art should understand that in many, if not most instances, such definitions apply to prior, as well as future uses of such defined words and phrases.

10 11 12 13 14 15

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention, and the advantages thereof, reference is now made to the following descriptions taken in conjunction with the accompanying drawings, 5 wherein like numbers designate like objects, and in which:

FIGURE 1 illustrates an exemplary modular personal access device (PAD) according to one embodiment of the present invention;

FIGURE 2 illustrates an Internet set-up connection of the exemplary modular PAD in FIGURE 1 and a corresponding base station according to one embodiment of the present invention;

FIGURE 3 illustrates an exemplary IP packet transmitted from the user control module to the base station according to one embodiment of the present invention;

FIGURE 4 illustrates an exemplary modular PAD in greater detail according to one embodiment of the present invention; and

FIGURE 5 is a flow diagram illustrating the operation of the exemplary modular PAD according to one embodiment of the present invention.

DETAILED DESCRIPTION OR THE INVENTION

FIGURES 1 through 5, discussed below, and the various embodiments used to describe the principles of the present invention in this patent document are by way of illustration only and should not be construed in any way to limit the scope of the invention. Those skilled in the art will understand that the principles of the present invention may be implemented in any suitably arranged web-enabled personal access device (PAD).

FIGURE 1 illustrates exemplary modular personal access device (PAD) 100 according to one embodiment of the present invention. PAD 100 comprises display module 105 and user control module 120. Display module 105 comprises display screen 110 and speakers 115a and 115b. Internally, user control module 120 comprises the necessary data processors and memory necessary to run applications (e.g., browser and e-mail) that access the Internet. As will be explained below in greater detail, user control module 120 also comprises wireless transceiver circuitry that provides PAD 100 with an Internet cordless phone capability.

User control module 120 comprises pointing device 125, which may be, for example, a mouse-type device or touch pad that enables a user to move a cursor on display screen 110. User control

module 120 also comprises a plurality of control buttons 130 (generally denoted by dotted line), microphone 140, speaker 150 and (optional) telephone keypad 160. Control buttons 130 may include, among others, the following keys or buttons: ENTER, VOLUME UP/DOWN, 5 Right Mouse, Left Mouse, UP/DOWN arrows, LEFT/RIGHT arrows, END, DELETE, ESC, TAB, and the like. A user browses the Internet and executes applications by maneuvering pointing device 125 and pressing control buttons 130. The user also may enter alphanumeric characters on telephone keypad 160. In an advantageous embodiment of the present invention, display screen 110 is a touch screen that allows the user to enter alphanumeric text by touching virtual buttons on an on-screen QWERTY keyboard.

10 FIGURE 2 illustrates an Internet set-up connection of exemplary modular PAD 100 and corresponding base station 200 according to one embodiment of the present invention. Base station 200 may be connected to the Internet by any known technique, including by cable modem, by digital subscriber line (DSL), by conventional 56K analog modem to the public switched telephone system (PSTN), by fixed wireless connection, and the 15 like. In an advantageous embodiment of the present invention, base station 200 comprises recharging circuitry and a holding cradle, 20 allowing PAD 100 to be recharged when not in use.

When a user is browsing the Internet, PAD 100 wirelessly transmits Internet protocol (IP) packets to base station 200 and receives IP packets from base station 200. PAD 100 and base station 200 may communicate using any conventional radio frequency (RF) access protocol, including one or more of code division multiple access (CDMA), frequency division multiple access (FDMA), and time division multiple access (TDMA), or any combination of such protocols.

A conventional cordless phone comprises a handset and a base station, both of which contain RF transceivers that communicate voice signals wirelessly, thereby permitting a person to move freely around the home or office. Advantageously, the RF transceiver circuitry found in PAD 100 and base station 200 are similar to the RF transceiver circuitry found in the handset and base station of a cordless phone. The present invention capitalizes on these similarities by allowing a person to make and to receive telephone calls via user control module 120, which functions as a cordless phone handset.

A user may initiate a telephone call by entering a number on (optional) telephone keypad 160. If telephone keypad 160 is not implemented in user control module 120, the user may enter the number using the touch screen capability of display screen 110. In

an advantageous embodiment of the present invention, when the user has entered the number, the call may be initiated by separating user control module 120 from display module 105. When user control module 120 detects that it has been detached from display module 105, user control module 120 stops operating in a web browser mode and begins operating in a cordless phone mode. The entered number is dialed out to the PSTN by base station 200. Alternatively, in a voice over IP application, base station 200 initiates a phone call via the Internet to the PSTN.

Similarly, a call may be answered when base station 100 transmits a call notification message to PAD 100. When user control module 120 detects the call notification message, an audible indicator (e.g., ring tone) or a visible indicator (e.g., message box) alerts the user, who may answer the call by separating user control module 120 from display module 105. Again, when user control module 120 detects that it has been detached from display module 105, user control module 120 stops operating in a web browser mode and begins operating in a cordless phone mode. When user control module 120 is being used in cordless phone mode, microphone 140 detects the user's voice and speaker 150 plays the incoming voice signal to the user.

FIGURE 3 illustrates exemplary IP packet 300 transmitted from

user control module 120 to base station 200 according to one embodiment of the present invention. When a user is browsing the Internet, IP packets are transmitted and received by PAD 100 and base station 200 in "non-real" time. That is, there is neither a 5 guaranteed maximum delay for IP packets nor a minimum transfer rate. If a web site visited by a user is busy, IP packets may be received by PAD 100 at a very slow rate and with a large delay. If errors occur during transmission of IP packets from base station 200 to PAD 100, the corrupted IP packets are normally re-transmitted, adding additional delay.

10 While high latency may be acceptable for most web browsing functions, a voice-over-IP telephony application requires real-time delivery of IP packets containing voice data. Therefore, when user control module 120 is being used as a cordless phone, IP packets must be exchanged with base station 200 at a guaranteed minimum bit rate and with a fixed maximum latency. In one embodiment of the present invention, when user control module 120 is separated from display module 105, user control module 120 transmits special purpose IP packet 300 to base station 200 to establish a voice 20 telephony connection. IP protocol defines a Type-of-Service (TOS) field that contains a Minimize Delay flag. The Minimize Delay flag is used by routers and other devices to give priority to IP packets

in which the Minimize Delay flag is set. In FIGURE 3, the TOS field is represented by low-latency bits 305, which may be used to minimize latency between user control module 120 and base station 200. The voice-over-IP telephony application sets the 5 Minimize Delay flag in low-latency bits 305 in order to give priority to voice packets between user control module 120 and the Internet. Corrupted voice IP packets may be discarded thereafter. However, this is acceptable in a voice signal, since corrupted IP packets only result in a very brief amount of static or intolerable voice distortion.

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FIGURE 4 illustrates in greater detail selected portions of display module 105 and user control module 120 in exemplary modular PAD 100 according to one embodiment of the present invention. Display module 105 comprises interface connector 405 that mates with interface connector 410 in user control module 120. When display module 105 and user control module 120 are connected, an electrical short created by jumper 415 between pins in interface connector 405 is detected by sensor 420 in user control module 120. When display module 105 and user control module 120 are disconnected, sensor 420 detects an open-circuit condition instead. Sensor 420 generates an output signal that indicates whether or not user control module 120 and display module 105 are connected.

User control module 120 comprises sensor 420, audio-video interface (IF) 425, user input IF 430, microcontroller 432, memory 434, user input IF 440, transmission processing circuitry 450, receiver processing circuitry 455, radio frequency (RF) transceiver (X-CVR) 460, all of which are coupled together by, and communicate via, communication bus 480. When a user is browsing the Internet, microcontroller 432 transmits video and audio signals associated with the web browser application to display module 105 via audio-video IF 425. Similarly, user inputs from the touch screen are transmitted from display screen 110 to microcontroller 432 via user input IF 430.

Memory 434 stores application programs executed by microcontroller 432 and data used by the application programs. Memory 432 may be any conventional memory, including static random access memory (RAM), dynamic RAM, and flash RAM. Microcontroller 432 may include any conventional data processor, including an x86-based microprocessor. User input IF 440 receives user manual inputs from optional telephone keypad 160, pointing device (mouse) 125, and control buttons 130.

20 Transmission processing circuitry 450 comprises a voice processor, such as a digital signal processor (DSP), capable of receiving an analog voice signal from microphone (MIC) 140 and

converting it to a sequence of IP data packets containing digital voice data. These functions may also be accomplished by a microprocessor using medium access control (MAC) protocol. Receiver processing circuitry 455 comprises a voice processor 5 (e.g., a DSP) capable of receiving a sequence of IP data packets containing digital voice data and converting the digital voice data to an analog voice signal that is transmitted to speaker (SPKR) 150.

During a voice-over-IP telephony application, radio frequency (RF) transceiver 460 receives IP packets containing voice data as a baseband signal from transmission processing circuitry 450. RF transceiver 460 then modulates the baseband signal to an RF signal that is transmitted to base station 200. RF transceiver 460 receives incoming RF signals from base station 200 and demodulates the incoming RF signal to a baseband signal comprising IP packets containing voice data. The IP packets are sent to receiver processing circuitry 455 and speaker 150.

During an Internet browser application, RF transceiver 460 demodulates IP packets received from base station 200 and transmits 20 the IP packets to microcontroller 432. Microcontroller 432 extracts web page data associated with the browser application from the IP packets and transmits it to display module 105 via audio-

video IF 425. Similarly, microcontroller 432 may receive user input data and commands associated with the browser application from user input IF 440 (e.g., keypad inputs, mouse inputs) or from user input IF 430 (e.g., touch screen inputs). Microcontroller 5 then converts the user input data and commands to IP packet format and transmits the IP packets as a baseband signal to RF transceiver 460. RF transceiver 460 modulates the IP packets to produce an RF signal that is transmitted to base station 200.

FIGURE 5 depicts flow diagram 500, which illustrates the operation of exemplary modular PAD 100 according to one embodiment of the present invention. Initially, user control module 210 and display module 105 are connected together and PAD 100 executes a browser application under the control of user inputs (process step 505). As the browser application is executed, microcontroller 432 continually monitors incoming IP packets from RF transceiver 460 to determine if base station 200 has transmitted a signal indicating that an incoming phone call is being received (process step 510). Microcontroller 432 also monitors user inputs from user input IF 430 and/or user input IF 440 to determine if the user is launching a phone call application that initiates an outgoing call (process step 540).

If a message from base station 200 indicates that an incoming

call is being received, microcontroller 432 alerts the user by means of an audible indicator (e.g., a ringing tone) and/or a visual indicator (e.g., a dialog box on display screen 110) (process step 515). To answer the call, the user may launch the 5 phone call application by separating user control module from display module 105, an action that is detected by sensor 420. Sensor 420 then notifies microcontroller 432 of the separation (process step 520). Next, microcontroller 432 transmits special purpose IP packet 300 to base station 200 to establish a low latency voice telephony connection between base station 200 and user control module 120. Microcontroller 432 then executes the phone call application and user control module 120 functions as a cordless phone (process step 525). At some point the user ends the call, such as by pressing a "Hang Up" button on control buttons 130, and reattaches user control module 120 to display module 105 (process step 530). At that point, microcontroller 432 may resume executing the browser application from the same point 10 15 where the incoming call was received.

If the user launches the phone call application in order to 20 make an outgoing call, microcontroller 432 prompts the user to enter the phone number on display screen 110 or keypad 160 (process step 545). Once the number is entered, the user may cause the

number to be dialed by separating user control module from display module 105, an action that is detected by sensor 420. Sensor 420 then notifies microcontroller 432 of the separation (process step 520). Next, microcontroller 432 transmits special purpose IP 5 packet 300 to base station 200 to establish a low latency voice telephony connection between base station 200 and user control module 120. Microcontroller 432 then transmits the dialed number to base station 200 and continues to execute the phone call application. User control module 120 then functions as a cordless phone (process step 525). As before the user may end the call by pressing a "Hang Up" button on control buttons 130 and reattaching user control module 120 to display module 105 (process step 530). Microcontroller 432 then resumes executing the browser application from the same point where the user initiated the outgoing call.

15 In an alternate embodiment of PAD 100, user control module 120 and display module 105 may be a single integral unit, rather than separate units. In such an embodiment, PAD 100 operates as a cordless speaker phone, rather than as a cordless phone handset. When the user dials a phone number or an incoming call is received, 20 the launching of the phone application automatically causes the transmission of special purpose IP packet 300 to base station 200, thereby establishing a low latency voice telephony connection

between base station 200 and PAD 100. Thereafter, the user simply speaks out loud and uses PAD 100 in speaker phone mode. Advantageously, if PAD 100 is a single integral unit, telephone keypad 160 may be omitted, since all manual user inputs may be 5 received from a touch screen on display 110.

In an alternate embodiment of PAD 100, user control module 120 may operate as a conventional cordless phone over the public switched telephone network (PSTN), rather than as an Internet telephone executing a voice-over-IP application. This may be accomplished by connecting base station 200 to the PSTN as well as to the Internet. When an incoming call is received or the user dials a phone number, user control module 120 ceases execution of the browser application and base station 200 establishes a conventional call connection at the central office of the PSTN. Thereafter, user control module 120 and base station 200 may exchange voice data according to any conventional protocol, not necessarily in the form of IP data packets.

Although the present invention has been described in detail, those skilled in the art will understand that they can make various 20 changes, substitutions and alterations without departing from the spirit and scope of the invention in its broadest form.

WHAT IS CLAIMED IS:

1 1. A personal access device (PAD) capable of browsing web
2 sites on an Internet protocol (IP) network comprising:

3 a radio frequency (RF) transceiver capable of wirelessly
4 communicating with a base station coupled to said IP network,
5 wherein said RF transceiver transmits IP data packets to said base
6 station and receives IP data packets from said base station; and

7 a PAD controller capable of executing an Internet browser
8 application and displaying web pages associated with said web sites
9 on a display screen of said personal access device, wherein said
10 PAD controller is further capable of transmitting voice data to,
11 and receiving voice data from, said base station via said RF
12 transceiver.

1 2. The personal access device as set forth in Claim 1
2 wherein said PAD controller transmits said voice data to, and
3 receives said voice data from, said base station in Internet
4 protocol (IP) data packets.

1 3. The personal access device as set forth in Claim 2
2 wherein said PAD controller and said base station establish a low
3 latency connection for transmitting and receiving said IP data
4 packets containing said voice data.

1 4. The personal access device as set forth in Claim 3
2 wherein said PAD controller executes a voice-over-IP application
3 capable of transmitting and receiving said IP data packets.

1 5. The personal access device as set forth in Claim 1
2 wherein said personal access device further comprises a microphone
3 for detecting the voice of a user and a speaker for transmitting an
4 incoming voice signal to the user.

1 6. The personal access device as set forth in Claim 5
2 wherein said personal access device comprises a display screen
3 module capable of housing said display screen and a user control
4 module removably attached to said display screen module, wherein
5 said RF transceiver and said PAD controller are disposed in said
6 user control module.

1 7. The personal access device as set forth in Claim 6
2 wherein said microphone and said speaker are disposed in said user
3 control module.

1 8. The personal access device as set forth in Claim 7
2 wherein said PAD controller is capable of determining when said
3 user control module and said display screen module are separated.

1 9. The personal access device as set forth in Claim 8
2 wherein said PAD controller, in response to a determination that
3 said user control module and said display screen module are
4 separated, establishes a low latency connection to said base
5 station for transmitting and receiving said voice data.

1 10. An apparatus for browsing web sites on an Internet
2 protocol (IP) network comprising:

3 a base station capable of transmitting IP data packets
4 to, and receiving IP data packets from, said IP network; and

5 a personal access device (PAD) comprising:

6 a radio frequency (RF) transceiver capable of
7 wirelessly communicating with said base station, wherein said
8 RF transceiver transmits IP data packets to said base station
9 and receives IP data packets from said base station; and

10 a PAD controller capable of executing an Internet
11 browser application and displaying web pages associated with
12 said web sites on a display screen of said personal access
13 device, wherein said PAD controller is further capable of
14 transmitting voice data to, and receiving voice data from,
15 said base station via said RF transceiver.

1 11. The apparatus as set forth in Claim 10 wherein said PAD
2 controller transmits said voice data to, and receives said voice
3 data from, said base station in Internet protocol (IP) data
4 packets.

1 12. The apparatus as set forth in Claim 11 wherein said PAD
2 controller and said base station establish a low latency connection
3 for transmitting and receiving said IP data packets containing said
4 voice data.

1 13. The apparatus as set forth in Claim 12 wherein said PAD
2 controller executes a voice-over-IP application capable of
3 transmitting and receiving said IP data packets.

1 14. The apparatus as set forth in Claim 10 wherein said
2 personal access device further comprises a microphone for detecting
3 the voice of a user and a speaker for transmitting an incoming
4 voice signal to the user.

1 15. The apparatus as set forth in Claim 15 wherein said
2 personal access device comprises a display screen module capable of
3 housing said display screen and a user control module removably
4 attached to said display screen module, wherein said RF transceiver
5 and said PAD controller are disposed in said user control module.

1 16. The apparatus as set forth in Claim 15 wherein said
2 microphone and said speaker are disposed in said user control
3 module.

1 17. The apparatus as set forth in Claim 16 wherein said PAD
2 controller is capable of determining when said user control module
3 and said display screen module are separated.

1 18. The apparatus as set forth in Claim 17 wherein said PAD
2 controller, in response to a determination that said user control
3 module and said display screen module are separated, establishes a
4 low latency connection to said base station for transmitting and
5 receiving said voice data.

1 19. A method of establishing a telephone connection for use
2 in a modular personal access device (PAD) capable of browsing web
3 sites on an Internet protocol (IP) network, the modular personal
4 access device comprising: 1) a display screen module capable of
5 housing a display screen; and 2) a user control module removably
6 attached to the display screen module, the user control module
7 comprising: a) a radio frequency (RF) transceiver capable of
8 wirelessly communicating with a base station coupled to the IP
9 network; and b) a PAD controller capable of executing an Internet
10 browser application and displaying web pages associated with the
11 web sites on the display screen, the method comprising the steps
12 of:

13 detecting an incoming call alert signal transmitted by
14 the base station; and

15 in response to the detection of the incoming call alert
16 signal transmitting voice data to the base station via the RF
17 transceiver and receiving voice data from the base station via the
18 RF transceiver.

1 20. The method as set forth in Claim 19 wherein the steps of
2 transmitting and receiving voice data comprise the substeps of
3 transmitting voice data to the base station in Internet protocol
4 (IP) data packets and receiving voice data from the base station in
5 Internet protocol (IP) data packets.

1 21. The method as set forth in Claim 20 further comprising
2 the step of establishing a low latency connection for transmitting
3 and receiving the IP data packets containing the voice data.

00260-50259960

**PORTABLE INTERNET BROWSER DEVICE WITH CORDLESS
PHONE MODULE AND METHOD OF OPERATION**

ABSTRACT OF THE DISCLOSURE

There is disclosed a personal access device (PAD) capable of
5 browsing web sites on an Internet protocol (IP) network and also
capable of operating as a cordless phone that provides a
conventional phone connection or a voice-over-IP phone connection.
The personal access device comprises: 1) a radio frequency (RF)
10 transceiver for wirelessly communicating with a base station
coupled to the IP network, wherein the RF transceiver transmits IP
data packets to the base station and receives IP data packets from
the base station; and 2) a PAD controller for executing an Internet
15 browser application and displaying web pages associated with the
web sites on a display screen of the personal access device. The
PAD controller is also capable of transmitting voice data to, and
receiving voice data from, the base station via the RF transceiver.

Patent Pending

NATI15-04362
SHEET 1 OF 4

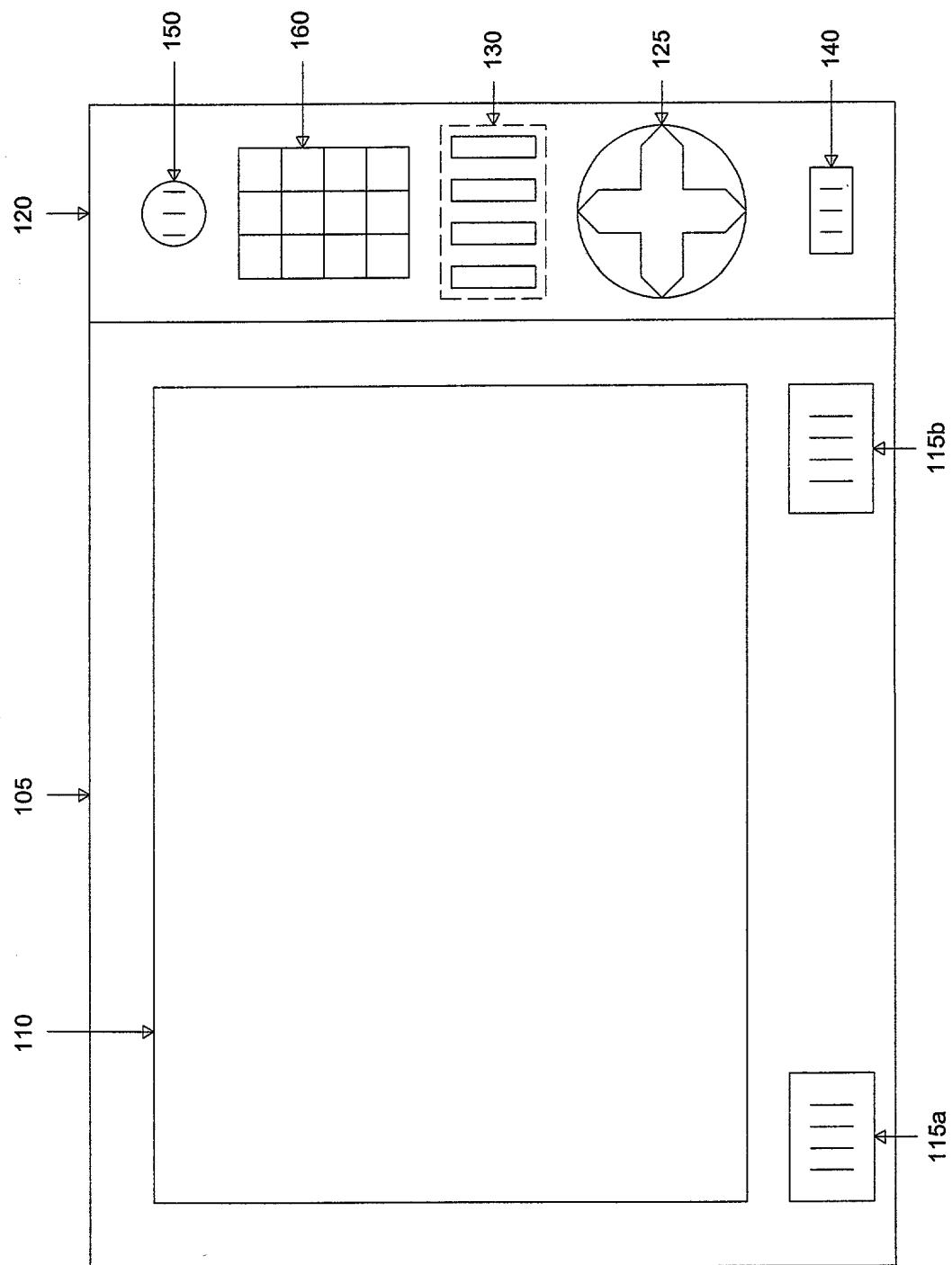


FIGURE 1

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NATI15-04362
SHEET 2 OF 4

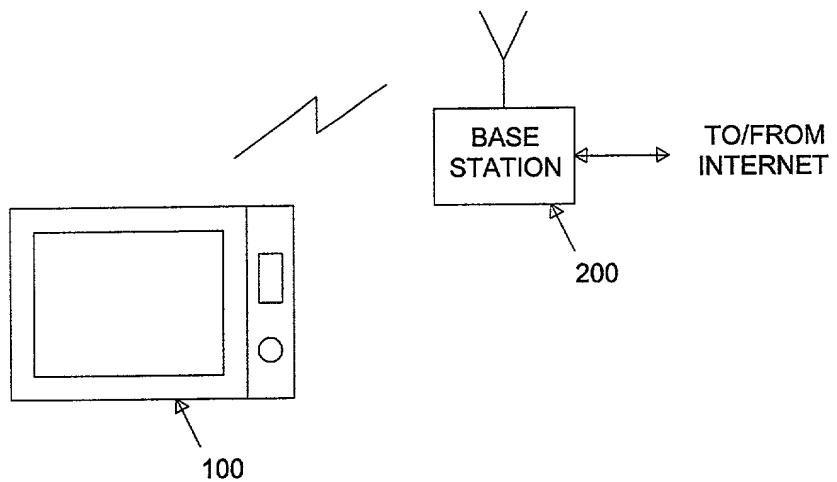


FIGURE 2

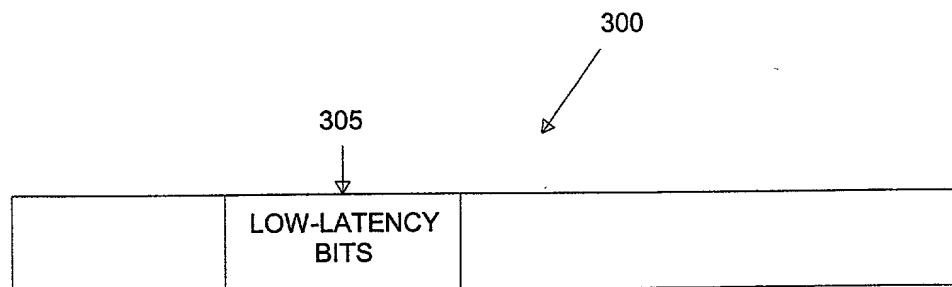


FIGURE 3

NATI15-04362
SHEET 3 OF 4

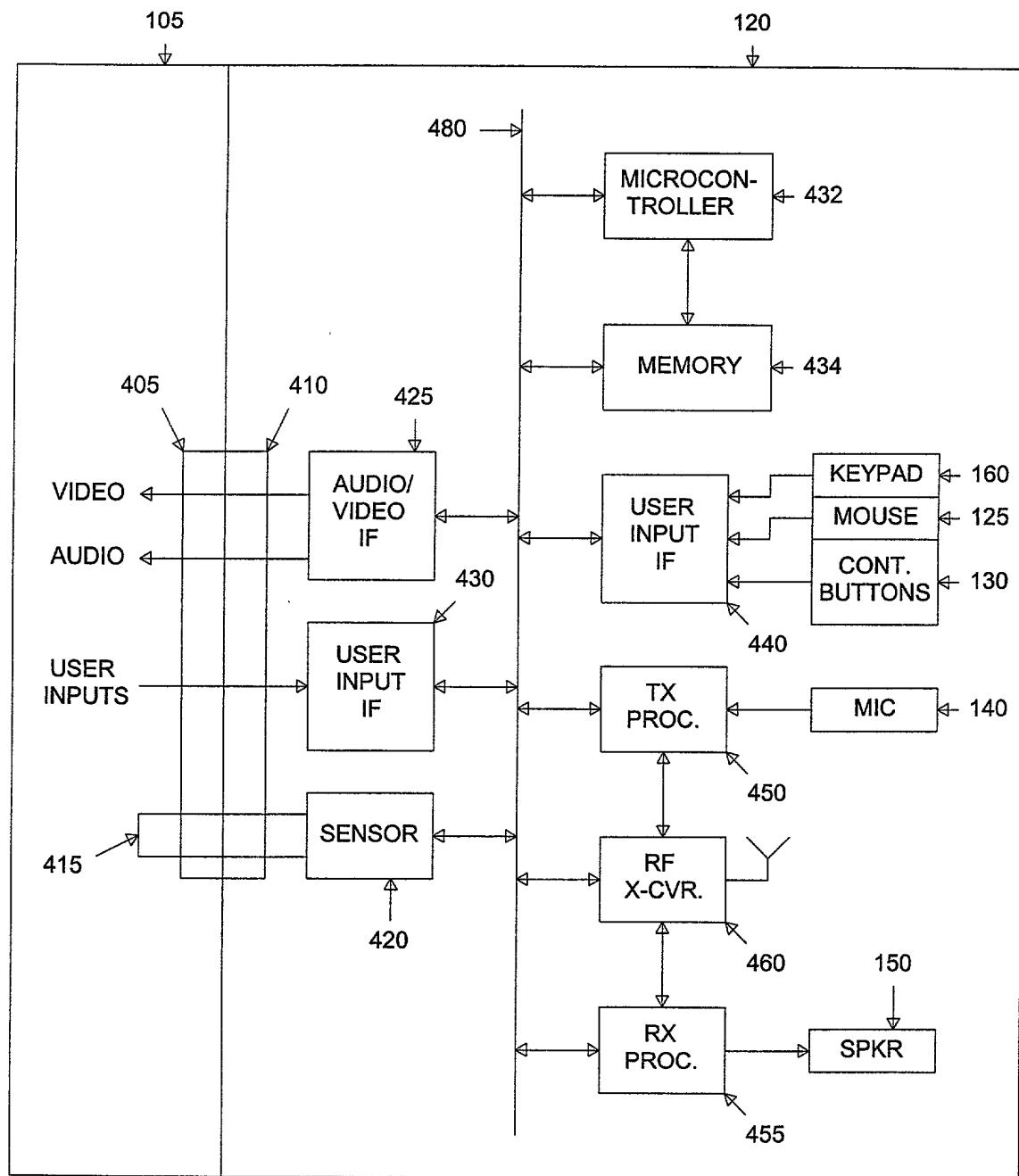


FIGURE 4

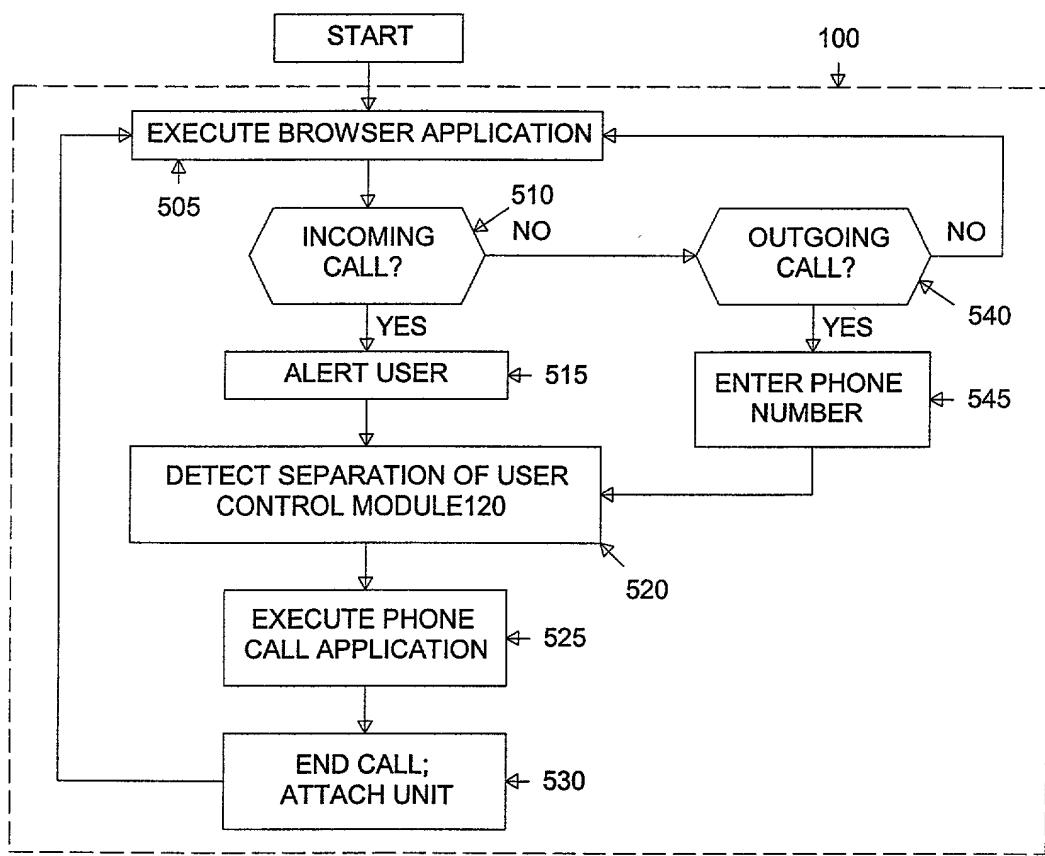


FIGURE 5

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PTO/SB/01 (12-97)

Approved for use through 9/30/00 OMB 0651-0032

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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**DECLARATION FOR UTILITY OR
DESIGN
PATENT APPLICATION
(37 CFR 1.63)**

Declaration Submitted with Initial Filing Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number	P04362
First Named Inventor	Willig
COMPLETE IF KNOWN	
Application Number	/
Filing Date	
Group Art Unit	
Examiner Name	Not Assigned

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Portable Internet Browser Device with Cordless Phone Module and Method of Operation

the specification of which

(Title of the Invention)

is attached hereto

OR

was filed on (MM/DD/YYYY) as United States Application Number or PCT International

Application Number and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?
			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	
		<input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

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I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)

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As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Customer Number → Place Customer Number Bar Code Label here

OR

Registered practitioner(s) name/registration number listed below

Name	Registration Number	Name	Registration Number
Andrew S. Viger	28,552	William A. Munck	39,308
John L. Maxin	34,668	John T. Mockler	39,775

Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet PTO/SB/02C attached hereto.

Direct all correspondence to: Customer Number OR Correspondence address below

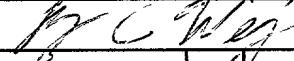
Name	John L. Maxin		
Address	National Semiconductor Corporation		
Address	801 East Campbell Road, Suite 525		
City	Richardson	State	TX
Country	USA	ZIP	75081
Country	Telephone	Fax	972-680-4523
Country			972-680-4515

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor:	<input type="checkbox"/> A petition has been filed for this unsigned inventor		
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Given Name (first and middle if any)	Family Name or Surname		
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Randy C.	Willig		
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Inventor's Signature				Date	9/20/02
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Residence: City	Fort Collins	State	CO	Country	USA	Citizenship	USA
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City	Fort Collins	State	CO	ZIP	80526	Country	USA
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Additional inventors are being named on the _____ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto

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DECLARATION		REGISTERED PRACTITIONER INFORMATION (Supplemental Sheet)	
Name	Registration Number	Name	Registration Number
Christopher Byrne	32,204		
Eugene C. Conser	39,149		
Coleman F. Reif	38,593		
Allen R. Tremain	40,207		
Peter Y. Wang	40,452		

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